Claim listing

Please enter the following new claim 97 to the claim listing, and enter the following amendments. This claim listing replaces all prior claim listings.

1 - 82 (Canceled)

83. (Currently Amended) The method of claim ~~92~~ 100, wherein the encoding of the beads is with color.

84. (Currently Amended) The method of claim ~~92~~ 100 wherein the polymer formed by polymerization is hydrophilic.

85. (Currently Amended) The method of claim ~~92~~ 100, wherein the biomolecules are ligands or receptors.

86. (Previously Presented) The method of claim 85, wherein ligands are peptides, proteins, nucleic acids (including DNA and RNA) or oligonucleotides.

87. (canceled)

88. (Currently Amended) The polymer-bead assembly of claim ~~93~~ 100, wherein one of the ~~substrate~~ the opposed planar surfaces is the surface of a silicon chip.

89. (Currently Amended) The method of claim ~~92~~ 100, wherein the beads have an average diameter of 0.5 um to 100 um.

90. (Canceled)

91. (Currently Amended) The method of claim ~~92~~ 100, wherein the beads include magnetic beads.

92. (Canceled)

93. (Canceled)

94. (Currently Amended) The method of claim ~~92~~ 100, wherein the separation of the opposing planar surfaces defines the thickness of the gel embedded bead assembly.

95. (Currently Amended) The method of claim ~~92~~ 100, wherein the polymer formed by polymerization is permeable to macromolecules.

96. (Currently Amended) The method of claim ~~93~~ 100, wherein the gel embedded bead assembly formed through polymerization is self-supporting and can be removed from the substrate.

97-99 (Canceled)

100. (Newly Added) A method of forming an assembly of encoded beads embedded in a gel securing the encoded beads in recesses in a planar surface, wherein the encoded beads in the assembly are encoded with different labels, and wherein differently labeled beads have different biomolecules displayed on their surfaces and the labeling indicates the type of biomolecule displayed on particular beads and the type of analyte said biomolecule is capable of binding with, the method comprising:

providing a polymerization mixture including the encoded beads and polymerizable components;

confining the polymerization mixture between two opposing planar surfaces wherein one of the two opposing planar surfaces has recesses which can accommodate the encoded beads; and

triggering polymerization of the polymerizable components to thereby form the gel, and thereby embed the beads securely in the recesses.

101. (Newly Added) The method of claim 100, wherein one of the opposed planar surfaces is the surface of an ITO electrode.

102. (Newly Added) A method of forming an immobilized planar array of particles, comprising the steps of:

providing a first electrode positioned in a first plane, and a second electrode positioned in a second plane different from the first plane, providing a polymerization mixture comprising a monomer and an initiator in an electrolyte solution wherein said polymerization mixture is located between the first and the second electrode;

providing a plurality of particles suspended in said solution;

generating an AC electric field with the electrodes such that the planar arrays of particles are formed, and

polymerizing the polymerization mixture to form a polymeric film in which the particles are embedded and thereby immobilized.

103. (Newly Added) The method of claim 102, wherein the first electrode comprises a light-sensitive electrode, and wherein the method further comprises the step of illuminating said first electrode with a predetermined light pattern, such that the illumination in combination with the generating of the AC field results in formation of an assembly of particles in a designated area of the first electrode, said designated area being

defined by the illumination pattern.

104. (Newly Added) The method according to claim 102, wherein the first electrode is an electrode having a surface and an interior, the surface or interior having been modified to produce spatial modulations in properties of the first electrode, said properties affecting the local distribution of the electric field at an interface between said first electrode and said electrolyte solution, such that the generation of the AC electric field results in formation of an assembly of particles in a designated area of the first electrode, said designated area being defined by the spatial modulations in the properties of the first electrode.

105. (Newly Added) The method of claim 102, wherein the polymerization mixture comprises a monomer, a cross-linker and an initiator.

106. (Newly Added) The method of claim 102, wherein the polymerization mixture comprises a hydrophilic monomer, a crosslinker and an initiator dissolved in an electrolyte solution, the electrolyte solution comprising an aqueous solution and wherein the polymeric film comprises a hydrogel.

107. (Newly Added) The method of claim 102, wherein the polymerization mixture has an ionic concentration of about 1 mM or less.

108. (Newly Added) The method of claim 102, wherein the polymerization mixture is a viscosity of about 100 cp or less.

109. (Newly Added) The method of claim 102, wherein the polymeric film comprises a cross-linked alkylacrylamide or hydroxyalkylmethacrylate hydrogel.

110. (Newly Added) The method of claim 105, wherein the initiator is a heat-activated initiator, and the polymerization step comprises heating the mixture to initiate the polymerization while maintaining the interfacial electric field.

111. (Newly Added) The method of claim 105, wherein the initiator is photoactivatable initiator, and the polymerization step comprises irradiating the mixture to initiate the polymerization.

112. (Newly Added) The method of claim 102, wherein the polymeric film comprises a polyacrylamide gel and the polymerization mixture further comprises preformed polymers, such that the polymerization of said mixture forms a porous polyacrylamide gel.

113. (Newly Added) The method of claim 102, wherein the first and the second electrode each comprises a planar electrode, said electrodes being parallel to each other and separated by a gap, with the polymerization mixture and the particles located in said gap, and wherein the field is generated by applying an AC voltage between the electrodes.

114. (Newly Added) The method of claim 102 wherein the second electrode is an ITO electrode.

115. (Newly Added) The method of claim 114, wherein said particles are beads having biomolecules attached to their surfaces.

116. (Newly Added) The method of claim 115, wherein the beads comprise different bead types, said bead types being distinguishable by the biomolecules attached thereto, and wherein the beads of each type are further distinguishable by a unique chemical or physical characteristic that identifies said bead type.

117. (Newly Added) The method of claim 116, wherein the beads are encoded with a chemical label, said chemical label comprising fluorophore dyes.

118. (Newly Added) The method of claim 102 wherein the array comprises subarrays that are spatially separated from each other, and the polymeric film comprises a patterned polymeric film.

119. (Newly Added) The method of claim 102, wherein the particles comprise magnetic particles.

120. (Newly Added) The method of claim 102, wherein the particles comprise eukaryotic or prokaryotic cells.

121. (Newly Added) The method of claim 102, wherein the particles comprise liposomes.

122. (Newly Added) The method of claim 102, wherein the particles comprise inorganic particles.

123. (Newly Added) The method of claim 102, wherein the first electrode comprises a planar electrode having a surface and an interior, the surface or interior having been modified to produce spatial modulations affecting the local distribution of the AC electric field at the interface.

124. (Newly Added) The method of claim 123, wherein the first electrode comprises a silicon electrode.

125. (Newly Added) The method of claim 123, wherein one or more areas of the surface

or the interior of the first electrode exhibits lower impedance than other said areas, and wherein the particles are assembled in the areas of low impedance.

126. (Newly Added) The method of claim 123, wherein the spatial modulation of the properties of the first electrode is carried out by modifying the surface or interior of the first electrode by spatially modulated oxide growth, surface charge patterning or surface profiling.

127. (Newly Added) The method of claim 102, wherein the first electrode comprises a light-sensitive electrode, the method further comprising the step of illuminating said first electrode with a predetermined light pattern, such that the illumination in combination with the AC field generation results in assembly of the particles.